



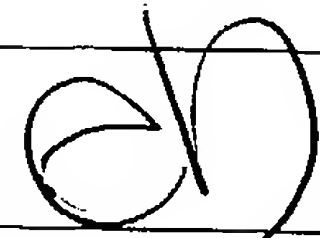
# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/028,657	12/21/2001	Vlad J. Novotny	AO-001-1D	2712
27946	7590	04/22/2004	EXAMINER	
ARTHUR J. BEHIEL 6601 KOLL CENTER PARKWAY SUITE 245 PLEASANTON, CA 94566			AHMED, SHAMIM	
			ART UNIT	PAPER NUMBER
			1765	

DATE MAILED: 04/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/028,657	NOVOTNY, VLAD J.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Shamim Ahmed	1765	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 21 December 2001.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Specification*

1. The disclosure is objected to because of the following informalities: The specification includes blank spaces at page 1, lines 6 and 16.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-4, 8-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Chang et al (5,959,516).

As to claims 1,8, and 13, Chang et al disclose a photolithographic process sequence of manufacturing MEMS structures, wherein forming a mask (61) over a first material layer (64) that is disposed over and in contact with a second material layer (66) and wherein the mask leaves portions of the first material layer exposed (col.6, lines 37-60, see also figure 5a).

Chang et al also disclose reactive ion etching is performed to half-etch the first material layer to form raised portions defined by recessed portions (specifically, col.6, lines 56-60).

Chang et al teach removing a portion of the mask layer and further etching the first material layer until the second material layer is exposed, leaving the pattern affixed to the second material layer (col.6, lines 60-67 and figure 5c).

As to claims 2-4,15-16 Chang et al teach that the etching process includes a first sub mask portion of silicon oxide (61) and a second sub mask portion of photoresist (not shown in the figure) (col.6, lines 46-58).

As to claims 9-12,17-18, Chang et al teach that the first material layer comprises semiconductor and the second material comprises an insulator (col.7, lines 4-12 and figure 5d).

As to claim, 14, Chang et al teach that forming a second mask (63) over a portion of the raised pattern, leaving a second portion and the recessed portion exposed (see col.6, lines 60-62, figure 5b).

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chang et al (5,959,516) in view of O'Neill (4,957,592).

As to claims 5-6, Chang et al discussed above in the paragraph 2 and also disclose an etching process of forming a second mask layer over a third material layer on a silicon -on -insulator (SOI) substrate, wherein the etching process formed recessed portion and raised pattern (col.7, lines 11-18 and figures 5d-5e).

Chang et al fail to teach the etching process forms a second depth less than the third material layer thickness and then etching the rest of the material in the recessed area.

However, in a process of silicon material layer etching, O'Neill teaches that partially etching or etching a depth that is less than the thickness of the silicon material layer and thereafter, continuing the etching process to remove the entire material to form through hole, wherein the partial etching provides a better control in the etch depth (col.1, lines 9-20 and figures 2-4).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of claimed invention to combine O'Neill's teaching into Chang et al's etching process for easily or efficiently controlling the etch depth of the pattern or the recessed as taught by O'Neill.

As to claim 7, Chang et al teach that the second material layer is disposed between the first material layer and the third material layer (see figure 5a).

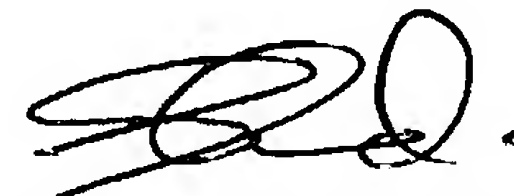
### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shamim Ahmed whose telephone number is (571) 272-1457. The examiner can normally be reached on M-Thu (7:00-5:30) Every Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine G Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 1765

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Shamim Ahmed  
Examiner  
Art Unit 1765

SA  
April 17, 2004